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ABSTRACT

Action research is disciplined inquiry to improve the quality of an organization and its performance. It is a method for improving practice in which one collects data to diagnose problems, searches for solutions, takes action, and monitors how well it works. Action research is characterized by groups of colleagues working together for systematic inquiry. In effect, the research is defined by the practitioners and conducted by those who want to improve their own situation. There are three types of action research: (1) the scientific method of problem solving; (2) the practical-deliberative action research; and (3) critical-emancipatory action research. The key to selecting the type of action research depends on the purpose of the inquiry. The process of collaborative action research begins with identifying the problem. This is followed by data collection planning and the actual collection of data. Data analysis follows, with the reporting and sharing of results with colleagues. The final step is working out a plan for action that incorporates what one learned from the inquiry. The strength of action research is that employees of a system work together to find their own solutions to problems so that they buy into the solution and feel ownership. (Contains 23 references.) (SLD)

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ACTION RESEARCH AND WAYS OF KNOWING

LITERATURE REVIEW

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

What is Action Research and Why is it Needed?

Action research is disciplined inquiry to improve the quality of an organization and its performance (Calhoun, 1993, P.62). It is a method for improving practice where one collects data to diagnose problems, searches for solutions, takes action, and monitors how well it worked. The University of Western Australia newsletter describes action research as a process "grounded in the day to day practice of teaching, which involves a cycle of planning, acting, observing, and reflecting" (Atherton Fellowship, April 22, 1999). Action research is characterized by groups of colleagues working together doing systematic inquiry that is collective, collaborative, self-reflective, and critical. There are four basic themes in action research: Participants are empowered, participation is through collaboration, there is acquisition of knowledge, and there is social change. Action research can be applied to groups, teams, and individuals as long as the key elements are maintained (Rimanoczy, 1999, p.1).

How is Action Research Different From Traditional Research?

The difference between collaborative action research and traditional research is that in the former, the researcher avoids any interaction with the subjects and the research is done by outsiders rather than by the participants themselves. The focus of action research is defined by the practitioners and conducted by those who want to improve their own situation (Sagor, 1992, p.7). They themselves initiate, monitor, adjust, and evaluation their own action.

In collaborative action research, the person taking action does the research and the data collected is used to determine actions that can be taken in the classroom or on the job site that will improve effectiveness (rather than for publication of a paper). The main

difference between collaborative action research and other research is the process.

The History and Development of Action Research

The exact origins of Action Research are unclear within the literature (Masters, 1995, p.1). Most writers say that this collective problem-solving research method originated with Kurt Lewin, an American psychologist, in the mid 1940s (Calhoun, 1993, p.62). There is evidence, however, that social reformists prior to Lewin used action research, such as Moreno in 1913, Collier in 1945, Lippitt and Radke in 1946, and Corey in 1953 (Masters, p.1). Stephen Corey introduced the term "action research" to the educational community in 1949 (Masters, p.1). He was one of the first to use action research in education (Canter, 1997, p.11).

The educational work of Progressives, such as John Dewey in the 1920s, may have served as a precursor to action research. Dewey used the scientific method of problem solving in education and other fields to address social problems brought on by World War II (Masters, 1995, p.2). In the 1930's, Reg Revans used the process at Cambridge University. He met with a group of employees, they asked one another questions, and brainstormed solutions to one another's problems (Masters, p.1). When Revans left the university to go to the Coal Board, he introduced this technique there. Instead of bringing in experts to solve their problems, he encouraged managers to meet together in small groups, to ask one another questions about what they saw. In this way they were able to find their own solutions. This may have been the point at which the Action Learning approach was introduced. According to Bunning, most literature credits Professor Reg Revans with pioneering the approach (Bunning, 1991, p.3).

Political scientists in the 1950s recognized that sticking to facts alone was

"inadequate to generate anything that aspired to the name of political science" (Bernstein, 1976, p.4). The thought was that theory was needed to assess and classify factual data. This theory was empirical and descriptive versus moral and prescriptive. Positivism influenced scientists to recognize two models for legitimate knowledge: the empirical or natural sciences, and the formal disciplines such as logic and mathematics. Anything which could not be reduced to these was viewed with suspicion (Bernstein, 1976, p.5). Bernstein said, " The tradition of political and social philosophy was broken as the most sophisticated and rigorous developments in Anglo-Saxon philosophy had shown there was not and could not be any rational discipline yielding genuine knowledge" (Bernstein, 1976, p.7). "Despite all the talk of objectivity and value neutrality, social science literature and so called empirical theory are shot through with explicit and implicit value judgments, and controversial normative and ideological claims" (Bernstein, p. 53).

The dilemma was that with traditional social science theory, social scientists were supposed to be disinterested observers, but pressure mounted on them to close the gap between theory and practice. This prompted a need to reexamine the understanding of social inquiry, and to reassess social science theory. Isaiah Berlin critiqued the empirical theory of the Positivists, saying there is a third major category of legitimate questions that cannot be clarified by formal or empirical techniques. He calls these philosophical questions as there was no wide agreement on the meaning of some of the concepts involved. He said that human beings interpret things and that this is important for understanding social and political life (their picture of the world). What people do is a result of how they perceive and interpret their experiences (Bernstein, 1976, p.61). Mental belief and physical movement are related. If we ignore this, our empirical studies

will be misleading. He said that in order to understand what human beings are, we need to understand the models that dominate their thought and action. Empirical studies restrict themselves to publicly observable behavior.

Mainstream social science was critiqued by Anglo-Saxon thinkers. They showed how limiting and constraining the framework assumptions were and pointed out that human beings interpret experiences and act accordingly. They challenged the idea in mainstream social science that phenomena must be either objective (observable) or lumped together as beliefs, attitudes and opinions, subjective and private. They said vocabulary is tied to social practice. Language is embedded in practices and shaped by rules and distinctions (Bernstein, 1976, p.113). From the theory of action, social scientists learned that proper analysis of human action involves references to social practices and forms of life in which actions can be described and explained. Practices and institutions depend on the acceptance of norms about what is reasonable and acceptable behavior. Anglo-Saxon thinkers said Empiricist theories of science are misleading and simplistic and lack interpretation and understanding. "The generalizations that could accrue from action research were less important for some theorists and highly significant for others. This conflict, which divided researchers into those who wanted elusive truths and those who needed practical, specific solutions caused a decline in the use of collaborative action research" (Canter, 1997, p.11).

In the 1950s and 1960s the Massachusetts Institute of Technology, and the Tavistock Institute in the UK used action research, as well as industry. Stephen Corey was one of the first to use Action Research in education in 1952 (Canter, 1997, p.11). In the 1960s and 1970s action research became a part of teacher training to improve practice

(rather than to produce theory or results). In the 1970s Stenhouse promoted the "teacher as researcher" movement in the UK. Stenhouse believed that all teaching should be based on research (Masters, 1995, p.2).

In the 1970s the institution of science came under increasing attack. Serious arguments were advanced that there are major defects inherent in the structure of science and in our conception of it as a method of inquiry (Mitroff, 1978, p.3). There are basic psychological differences between the proponents of differing views of science. The phenomenological alternative was life-world as opposed to objective scientific world. Husserl said "Knowledge of the objective scientific world is grounded in the self-evidence of the life world" (Bernstein, 1976, p.129).

Critics of science said an interpretation couldn't be limited to qualities among dependent and independent variables. Individuals in their social and political lives are self-interpreting beings. The ways in which they interpret their actions and those of others are not externally related to those actions. The world doesn't neatly divide into facts and values. Humans are motivated to do certain things. One can't identify and understand human action without taking into account the meaning actions have for the participants and the ways in which they interpret their own actions and the actions of others (Bernstein, 1976, p.29). These meanings and interpretations can't be correlated with external behavior , but are part of the activities and practices of our social and political lives.

We have to understand their thoughts and actions to know what humans are. Looking only at observable excludes this dimension – we need to know the meaning of action for the agent. Interpretation which has historical origins is what causes these

observable behaviors. In 1976, Bernstein said that it doesn't have to be one theory, either empirical or interpretive or critical. Rather all are implicated and an adequate social and political theory needs all three (Bernstein, 1976, p.235)..

Reinharz, a sociologist, became disillusioned with certain research approaches and he advocated a model of discovery. He said the experiences of socialization and of research must first be adequately described before they can be tested. He believes in using case studies, qualitative data analysis, and inductive understanding of grounded experience that adopts a reflexive stance on the research endeavor. He says there are other ways besides quantitative measures to produce social science knowledge (Reinharz, 1984, p.xvii). He says the meshing of person, problem, and method produces dilemmas with all methods and that these can be resolved by strengthening identification with the discipline(Reinharz, p.195). For example, experiential analysis violates the ground rule of most social sciences in striving for objectivity.

Experiential analysis is a form of research where the researcher is reflecting on experiences embodied in action and interacting during the course of ongoing, patterned social events (Reinharz, p.355). The meaning is created in between action and reflection, and this is the meaning the researcher strives to capture. The researcher looks inward and outward and is involved rather than detached. Where objective studies produce information about something, experiential analysis produces intimate knowledge that something is the case, of knowledge for some purpose. The researcher lives through the thing being studied and this is the certainty(Reinharz, p. 363). Where phenomenological method reduces experiential data to their essences to construct an absolute consciousness, experiential analysis accepts the given and associates this material with other aspects of

the social environment. The relationship between experiences and the situations that engendered them is sought. The sociologist looks at the interplay of experiential data and the social situations that generate them. Without the context of the situation, the data could be imposed, misplaced and possibly based on erroneous assumptions (Reinharz, 1984, p. 363). "Experiential analysis studies experiences in their entirety, not dissected into variables that have no experiential referent " (Reinharz, p. 363). Experiential analysis is performed with minimal expectations of what will be created as opposed to originating in the interest of supporting or proving a theory (Reinharz, p.364).

In the 1970s there began to be a growing criticism of the separation between the philosophy and the sociology of science. The criticism was that "while the separation relieved them of having to understand each other's knowledge and concerns, one cannot properly study or understand the social-institutional system of science independent of its cognitive-intellectual structure" (Mitroff, 1978, p.107). Mitroff called for the entire field of science to be revised in separating the history, philosophy, psychology, sociology and methodology of science from one another. He said "anything less than a systemic or holistic approach will fail to capture and do justice to the phenomenon of science" (Mitroff, p.107). Each method is valid in its own way and has its own advantages and disadvantages. Social science isn't concerned solely with the experimental-statistical verification of hypothesis and the discovery of general laws (Mitroff, p.132).

It wasn't until Kurt Lewin constructed a theory of action research with a set of steps, that it became an acceptable method of inquiry. Lewin argued that social scientists have to include practitioners from the real social world in all phases of inquiry to understand and change social practices (Masters, 1995, p.1). His model views research

as being composed of action cycles including analysis, fact-finding, conceptualization, planning, implementation and evaluation (Masters, p. 2).

The first major book by one author on action learning came out in 1992, by Reg Revans (Mumford, 1999 p.1). Revans contends that knowledge which already exists is insufficient on its own for learning. He feels the questioning component needs to be added for insight (ANBAR, 1999, p.1) He describes the following equation for learning: Learning (L) = Programmed Knowledge (P) + Questioning Insight (Q). Revans says the ability to ask the right questions at the right time, and take action is the heart of Action Learning (ANBAR, p.1). Action Learning focuses on what you don't know rather than on what you do know, and on coming up with multiple solutions. It should not be used for solutions already known. Action research first asks questions to clarify the nature of the problem, then looks at possible solutions, and finally takes action. The desired outcome of Action learning is enhanced organizational capacity to learn and change (Bunning, 1991, p.6).

Types of Research Studies

There are two main types of research studies: Quantitative (experimental and non-experimental studies) and qualitative (qualitative and historical studies) (Atherton Fellowship, 1999). Experimental studies set up a hypothesis and test it using a series of experiments. Objective measures of performance have to be set up and outside factors need to be controlled. Non-experimental quantitative studies try to deduce casual relationships, such as predicting changes. The relationship between two variables is evaluated. Qualitative studies use reference groups, focus groups and interviews to gather subjective data concerning the topic. These studies look at the subject over a long

period of time.

Quantitative methods provide estimates of relations between variables. The researcher needs some kind of quantitative measure of the reliability of the estimates (the degree of closeness with which the two variables moved together (Meek, 1971, p. 50). There could be bias in the questionnaire and answers given in interviews may depend on the interviewer. Sampling taken during one period may be different from one taken another period (Meek, p.72).

Research Strategies

There are four principal research strategies for understanding the world: experiments, surveys, field research, and the use of available data (Singleton, 1993, p.7). Psychologists tend to favor experiments, sociologists most often do surveys, anthropologists usually conduct field research, and historians tend to use available data. All four of the strategies could be used to study most social science topics (Singleton, p.9). Each strategy has its strengths and weaknesses that make the researcher favor one or another depending on the situation.

Experimental Approach:

Experiments frequently offer the best approach for investigating the causes of phenomena. The researcher manipulates some feature of the environment and then observes whether a change follows in the behavior under study. First, random assignment of subjects to treatment and control groups ensures that pre-experimental differences will be distributed evenly among the groups. Controlling extraneous variables is the key to doing this effectively (Singleton, Straits, & Straits, 1993, p.209). Treatment and control group subjects must experience the same events during the experiment except for the

manipulation of the independent variable. In this way one can infer that the manipulation caused the differences in measures of the dependent variable.

In a good experimental design, the researcher does only thing at a time, allowing only one independent variable to vary, while controlling all other variables. Pre-experimental designs violate this principle by permitting a number of variables to go uncontrolled, presenting threats to the internal validity of the study. True experimental designs rule out these threats. Factorial designs manipulate two or more independent variables. Quasi-experimental designs lack some feature of true experiments, such as randomization. Experiments are high in internal validity, but tend to be limited in generalizability (in a different setting), or low in external validity (Singleton, Straits, & Straits, p.209). Most think of this method as the scientific method with its key features of manipulation and control. Data analysis begins and ends with the researcher's hypotheses.

Surveys:

Survey research involves using questionnaires or interviews on large groups of people. Surveys can tell the researcher certain characteristics among groups. The general features of survey research are: a large sample is chosen to represent the population by some form of probability sampling, questionnaires or interviews are used to ask prescribed questions, answers are recorded, coded and analyzed with the aid of statistical software (Singleton, Straits, & Straits, 1993, p.246). Surveys are good for describing large populations in terms of a broad range of characteristics, attitudes and behavior, and they can address a wider range of research topics (Singleton, Straits, & Straits, p. 278). On the other hand, surveys present problems in inferring relationships,

are limited to reports of behavior rather than observations, and are subject to reaction. There are two types of survey designs, cross-sectional (data gathered at one point in time) and longitudinal (data is gathered at two or more points in time).

Field Research

Immersing oneself in a naturally occurring set of events helps the researcher to gain firsthand knowledge of the situation. This approach is recommended when it is essential to preserve whole events, when a situation is complex, involving interrelated phenomena that must be studied as a whole, or when the focus is on the relationship between the person and the setting. The stages of field research are: select a setting and topic, gain access, present oneself and establish roles, take field notes, and begin analysis, develop analysis, leave the field, write report (Singleton, Straits & Straits, 1993, p.330). Field research is an inferior way of testing specific causal hypotheses, is very time consuming, and is sometimes an inefficient method of gathering data (Singleton, Straits & Straits, p.349). The method is highly dependent on the observation skills of the researcher.

Doing a social science field study (also called ethnography, qualitative study, grounded theory naturalism, case study) involves three tasks: Gathering (collecting and assembling data), focusing (asking questions about this data), and analyzing (developing and presenting an analysis of the data) (Lofland & Lofland, 1995, p.1). Qualitative field study is different from other research methods in that the researchers are observers and participants in the lives of the people being studied. The researcher witnesses how others feel and act and many believe that only through this type of direct experience can one accurately know about social life(Lofland & Lofland, p.3).

For field study the workers are usually emotionally engaged in the topic due to their history, and the agenda is personally meaningful (Lofland & Lofland, 1995, p.15). Face to face interaction is best, where one puts oneself in the role of the other. This is different from the objectivity and distance kept in experimental research. Data is collected from Informal interviews and observation. There are many threats to access of information in field study, such as factions, trade-offs, closed doors, and insider understandings (Lofland & Lofland, p.57). It is difficult not to align with one division, group, or clique. People who are tolerating an observer may want to know what they get in return-what the trade-off is. There may be some closed doors to a part of the setting and making allies helps in this case. Key informants from the inside can help the researcher with the same understanding of the setting that participants have.

A criticism of fieldwork is that the data is fictional (Lofland & Lofland, 1995, p.68). "Data are sometimes claimed to be fictional as field notes filter rather than mirror what "actually" happens" (Lofland & Lofland, p.68). All human observations are filtered and interpretations vary. But, the authors contend, filtering is not fabricating.

Available Data

The fourth strategy for doing social research uses available data as opposed to the other three methods, which involve the firsthand collection of data. Researchers can use data generated for other purposes, called second hand data, such as: court records, vital statistics, Census Bureau data, diaries, letters, business records, tax reports, mass media, works of art, surveys, etc. It is the most popular method of social research (Singleton, Straits & Straits, 1993, p.387).

Triangulation

The use of multiple approaches to a research question is called triangulation (Singleton, Straits & Straits, 1993, p.391). The advantage of using triangulation or several methods to test hypotheses is that different methods do not share the same methodological weaknesses. If different methods produce similar findings, this builds confidence in the results.

"Scientific theories render a sense of understanding by positing causal relationships and processes that connect events. This understanding is considered fragile and incomplete, however, since the observed patterns among events are always subject to change or reinterpretation. Thus there are no ultimate explanations in science, and it follows that scientific theories should not be judged as true or false, only useful" (Singleton, Straits & Straits, 1988, p.37).

The production of scientific knowledge requires a constant interplay between theory and research. Therefore, the process is cyclical, with theories leading to predictions, predictions to observations or research, and observations to generalizations that have implications for theory. Throughout this process, empiricism, objectivity, and control guide scientists.

Types of Action Research

There are three types of action research: The scientific method of problem solving, the practical-deliberative action research and the critical-emancipatory action research. In the scientific method, a problem is identified and an intervention is tested. Communication is primarily between the facilitator and the group (Masters, 1995, p. 4). In the second type, practical-deliberative, both the researcher and practitioners reach a

mutual understanding of the problem and of the intervention needed. Criticism of this model by McKernan is that it trades off some measurement and control for human interpretation. The third type of action research promotes political and practical action to promote change. It raises the collective consciousness of practitioners and tries to connect theory to practice.

It is the underlying assumptions that cause differences in the application of method for these three modes of action research, not in the methods used. It all seems to be a question of power: In technical action research the facilitator with the idea controls the power. In practical action research, power is shared between participants. In emancipatory action research, power resides with the group, not the facilitator.
Some of the approaches that shape social science inquiry are the interpretive or hermeneutic approach, ethnographic, historical, and phenomenological. The interpretive approach to the study of human society looks at interpreting symbols, cultures, and historical moments (Rabinow & Sullivan, 1979, p.1). With scientific inquiry things are explained out of context. For comprehending the human world, a subject is not reducible to categories that relate to each other (Rabinow & Sullivan, p.3). Holistic inquiry seeks to organize a wide variety of human phenomena that can't be comprehended through linear relations among elements. It is important to study the subject in the context of the situation, for that is the meaning. Only treated as a whole, do the parts make sense (Rabinow & Sullivan, p.11). The culture and social world needs to be brought into the analysis in order to understand the event. Rabinow gives the example that we might not understand a cockfight unless we know the Balinese cultural and social world. Beginning in the 1920s, Adorno and Horkheimer wrote about contextual reason as opposed to

scientism, a context free method (Rabinow & Sullivan, 1979, p.15). An interpretive approach increases understanding if theory is not separate from the enterprise, as then insights and techniques from a variety of disciplines are available to the researcher. Interpretists argue that we can't come to understand important parts of human life within the bounds set by a scientific orientation (Rabinow & Sullivan, p.31). We need to know the meaning of the element for the subject.

Things only have meaning in a field, in relation to other things. There is no such thing as a single, unrelated element. If changes in other meanings in the field can cause changes in the element, meanings can only be identified in relation to other meanings (Rabinow & Sullivan, 1979, p.33). Man can't interpret meanings independently of his interpretation of them for one is woven into the other (Rabinow & Sulivan, p.37). Those following the empiricist tradition try to reconstruct social reality as consisting of data alone. These data are the acts of people (behavior) identified supposedly beyond interpretation. This excludes a consideration of social reality or common meanings. We need to go beyond the bounds of science based on verification to inquiry, which studies the inter-subjective and common meanings in society.

Hermeneutics concerns the rules required for interpreting written documents because they are not spoken languages. Spoken word is within context of an event, whereas there is a distance between the intention of the speaker and the verbal meaning of a text. "The correlation between explanation and understanding, between understanding and explanation, is the "hermeneutical circle" (Rabineau & Sullivan, 1979, p.101).

The key to selection of the type of action research (whether individual, collaborative, or school wide) depends on the purpose of the inquiry. The researchers must choose the method that best serves their needs (Calhoun, 1993, p.63). Data can be qualitative or quantitative. The larger the collaborative research team, the greater the variety of methods that can be used as labor is divided.

Action Reflection Learning

Action Reflection Learning (ARL) is a modified version of Action Learning. It was defined in the mid 1980s by Ernie Turner, president of LIM USA. Ernie and his colleagues found that learning does not automatically result from action. For learning to occur, reflection on the action taken is needed. It is necessary to pause in the action and introduce a challenging question to promote reflection on what happened. The literature has the least amount of coverage on the reflection part of action research, and yet reflection has a major role in the action learning process (Rimanoczy, 1999, p.2). Taking the action of solving a problem does not necessarily lead to learning. For learning to take place on has to reflect on that experience to identify what has been learned and to internalize the lessons (Bunning, 1991, p.1) "Research in the field shows that most managers spend more time doing than thinking" (Anbar-Action Learning for Managers p2). By reflecting, and reviewing, managers can learn to solve their own problems in the workplace and learn from it.

The cyclical steps of Action Reflection Learning are: 1. Action, 2. Reflection on action (awareness, need to change), 3. Plan, and 4. New action (new behavior equals learning) (Rimanoczy, 1999, p.1). The key element of ARL is asking questions for awareness. The principle is that people have the knowledge to find their own answers,

but need to be asked questions in order to find them. They also need to reflect to discover how they did something, what should be repeated or avoided in the future, and what past actions should guide future ones. With ARL, a personal journal is kept to aid in clarifying one's thoughts and connecting with oneself.

The learner begins by stating the question that he/she wants to work on. A mentor, or learning coach helps the learner to find his/her own answers using questioning. This coach acts as a mirror, asking questions that help the learner to see himself so he can reflect and be aware. The coach acts as the dialogue partner. Action reflection learning is based on the principle that learning happens best when the person is in the problem situation (Rimanoczy, 1999, p.2). Questions are also asked to take into consideration the system environment and the impact of solutions on the whole system. Many perspectives are considered to determine the one that is feasible in the system in which the learner works.

What is the Process of Collaborative Action Research?

The process of collaborative action research consists of six sequential steps. First is identifying the problem or the issues of concern. This includes a personal reflection of important issues, and a literature review to expand the knowledge base on issues relevant to the problem. The problem must be significant and must be within the researcher's sphere of influence. A written problem statement and graphic reconstruction can be helpful to show relationships among variables.

The second step is to plan for data collection. Quality data must be collected that is reliable and valid. "The secret for getting valid and reliable data is to use multiple independent sources of data on the phenomenon" (Dr. Sagor, Canter, 1997, Collaborative

Action Study Guide, p.46). By combining many sources of data one can view patterns and practices clearly. Results are believable when supported by a variety of assessment measures.

In the third step, data collection, the following strategies can be used: Open-ended observation lists, pre-defined checklists, and pre-defined rubrics (Canter, 1997, Collaborative Action Study Guide, p.26). Existing sources of data that can be used are student work, portfolios, teacher records, and student files. Methods for collection of data are classroom observations, student and teacher journals, and audio or video tapes. Tools for questioning are tests, interview questions, and surveys.

The goal of data collection is to understand what is happening in your school or classroom and to determine what might improve things in that context as opposed to coming up with findings applicable in other settings (Sagor, 1992, p.28). The data has to be valid and reliable (methods used have to be accurate). Three questions should be asked before data collection: Do the instruments chosen measure what you claim they do? Do the instruments and methods accurately measure what you are studying? Will a skeptic be convinced by the weight of data amassed? Triangulation is a technique of using at least three independent windows on whatever phenomenon is being studied (such as using observation, videotape and interview of the same class). Also data collection plans can be critiqued by two or three others to guard against incomplete data collection (Sagor, p.47). Sources of data can be existing student portfolios, past evidence, journals or diaries, photographs, shadowing, observations, videos, interviews, written surveys, tests (Sagor, 1992, p.32).

The fourth step, data analysis involves taking all collected data and sorting it into

groups. A bin is created for every major theme. Then the data is skimmed to look for trends or patterns, recurring words, phrases, themes, and patterns and relationships. The data can be quantitative (such as the percentage of students that said or did something), or qualitative or subjective (their comments). Data is sorted and analyzed to answer two basic questions: 1. What are the important themes in this data and 2. How much data support each of these themes? (Sagor, 1992, p.48).

In the fifth step, research results are reported and shared with colleagues. A written report of the research and action plan can help others teachers benefit from the research. The report usually includes an introduction, statement of the problem, research methods used, findings, and plan for future action.

The sixth and last step is where a plan for action is worked out which incorporates what one learned from the inquiry. Action is taken based on the collected data. The data can be presented, a pilot program can be started.

Participatory action research involves practitioners in the research process from the initial design, through gathering data and analysis, to final conclusions and actions. This contrasts with the conventional method of pure research in which members were treated as passive subjects. The principle is that science is achieved not by distancing oneself from the world, but from engagement with the world. Participatory action research evolved out of three streams of intellectual development and action: social research methodology, participation in decision making by low ranking people in organizations, and sociotechnical systems thinking regarding organizational behavior (Whyte, 1991, p.7). There is no one best way to do social research- different problems call for different strategies (p.8). It emerged out of a concern with the limitations of other

approaches.

How Has Action Research Contributed to the Field of Education?

In all professions but teaching, people interact with their colleagues and are expected to contribute to their profession's knowledge (Sagor, 1992, p.2). Most educational journals do not feature the work of public school teachers, but that of consultants, and administrators who work outside the classroom (Sagor, p.3). In education, teachers can use collaborative action research to improve teaching and learning in their schools and to contribute to the development of their own profession (Sagor, 1992, p.6).

Academics have become the first interested in action learning. It offers a holistic approach to learning. It is a new paradigm for education (Mumford, 1999, p.3). The concept of the teacher being a researcher has been included in literature on educational reform. Teachers are encouraged to collaborate in revising curriculum, improving their work environment, and professionalizing teaching (Johnson, 1993, p1).

Collaborative action research benefits teachers, students and the teaching profession. Teachers work in collaboration with peers rather than in isolation; they focus on issues that are most critical to their teaching practice and use their research to take actions that will make a difference in their classrooms and schools. Teachers and employees who take part in collaborative action research can upgrade the status of the teaching profession and improving the quality of education it provides.

Action research has also been used for professional development, systems planning, and policy development. It has been used for restructuring, and evaluation. "There is a growing body of evidence of the positive personal and professional effects that action

research has on the practitioner. It provides teachers with the opportunity to gain knowledge and skill in research methods and teachers become more aware of the possibilities for change" (Johnson, p.2).

Teachers involved in action research become more reflective about their own practice and think more about their whole approach (Johnson, p.2). Scholar teachers say that their teaching flows from what they have learned through research (Boyer, 1990, p.1). Faculty learn from students as students learn from faculty. When students join faculty in common inquiry, there is opportunity for shared ideas (Boyer, 1990, p.1)

The Strengths and Challenges of Action Research

I would venture to say the strength of action research is that the employees of the system work together to find their own solutions to problems so they buy in to the solution as feel ownership. The challenge would be that some administrators might see sharing power or empowering others as losing power, or might feel that decisions must come from the top, which can roadblock the process.

Criticisms of Action Research

New suggestions of ways to research challenged conventional analytic science where the person conducting the research does not get involved and supposedly is objective. Can we really be objective taking data out of context?

The first major challenge to the practice of action learning came in 1988 from Smith. He criticized the approach because he felt it was dangerously limited. He said the questioning approach could not stand on its own and the questioning approach is the whole basis of action learning. He felt that action learning must include programmed knowledge and inputs relevant to resolving the problem (Mumford, 1999, p.2). Mumford

wrote that action learning doesn't pay attention to context, or the behaviors of managers in the learning organization. In practical-deliberative research, both the researcher and practitioners reach a mutual understanding of the problem and of the intervention needed. Criticism of this model by McKernan is that it is based on human interpretation, so trades off some measurement and control.

Criticisms of the hermeneutical approach are that there is a certain amount of insight which can't be communicated by gathering data (Rabineau & Sullivan, 1979, p.67). When using the science of interpretation, one can't achieve the degree of fine exactitude of a science based on data. The procedures of validation for testing guesses are more like guessing probability (showing an interpretation is more probable in light of what is known) than to empirical verification (showing a conclusion is true) (Rabineau & Sullivan, p.90). It is validation as opposed to verification.

Hischman, 1970, says we have a compulsion to theorize and this can sometimes lead to shortcuts to the understanding of reality (Rabineau & Sullivan, 1979, p.163). He says if we look for large-scale social change we must look for what is possible, rather than relying on what has been certified as probable. "The architect of social change can never have a reliable blueprint. Each house he builds will be different, will use new materials and he will experiment with untested principles. Therefore, what can be most usefully conveyed is an understanding of the experience (Rabineau & Sulivan, p.179). We can't understand an isolated event unless we know the inner lives. The author argues that what is in the text can change and so it is never independent of interpretation. Within the light of some purpose, is a literal reading, but no reading is the literal reading if apart from any purpose. For different purposes, text can have different meanings. We can only

understand text if we know the purpose and the situation (Rabineau & Sulivan, p.253).

When Action Learning Should Not be Used

There are times when action learning should not be used. Action learning should not be used when senior management will do what they want regardless, or when inflexible management will reject the participants' ideas. It should not be used when an answer to the problem already exists, or when a programmed learning type of approach will produce a solution. Action learning takes time and money, so if a solution can be found quickly and cheaply, it should be used (ANBAR, 1999, p.1). It should be used when no one knows the solution to a problem and when the organization is committed to the principle and would consider implementation of solutions.

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